Chronic Bacillary Dysentery

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The investigation of chronic diarrhœa forms an important part of the examination of patients invalided from overseas commands, particularly from the tropics. This involves adequate laboratory examination for intestinal protozoa, flagellates, and dysentery organisms.

During the course of the laboratory investigations on seven hundred of such patients with a history of chronic diarrhœa, dysentery organisms were isolated from forty, and it is felt that the presentation of the laboratory findings in this small group may prove of some general interest and serve as a guide to other workers in this field.

This group of cases forms a fairly average sample of the types of case returning to this country with a previous history of repeated or relapsing amœbic and bacillary infection.

The history needs to be carefully retaken and previous diagnoses, unsupported by laboratory confirmation, not unduly stressed. Many cases with repeated attacks of diarrhœa are, in the tropics, diagnosed as amœbiasis, and treated on quite "a priori" grounds with courses of amœbicidal drugs. Therefore, previous *clinical* diagnoses of intestinal amœbiasis should be treated with some reserve.

Of the forty cases under review, only seventeen gave a clear-cut clinical history of acute bacillary dysentery; twelve were diagnosed as intestinal amœbiasis; three were unequivocal cases of sprue, and the remainder undiagnosed diarrhœa.

The previous treatment varied with the previous clinical diagnosis. Only nineteen had some form of sulpha-drug therapy, and the sulpha-drug was not always administered during the initial attack. This in some cases was due to the exigencies of war. For example, two of the cases were members of an air crew who were forced to bail out over enemy territory, where they developed bacillary dysentery, which remained untreated until they regained Allied lines.

Twenty of the cases had a full course of amœbicidal therapy.

Methods.

Stool Examinations.—Fresh normally passed stools were examined daily for three days for the presence of protozoa or flagellates. The stools were also cultured in parallel on eosin methylene blue agar and on the sodium desoxycholate citrate medium (Hyne's modification).

After carrying out biochemical tests on any intestinal pathogens isolated, they were then classified, using Oxford standards anti-sera. Final typing of Flexner strains was carried out, using specific absorbed monovalent sera.

Sigmoidoscopy.—The patients were prepared for sigmoidoscopy by having a rectal wash-out with saline at 20.00 hours. They took no further food or hot drinks until they presented themselves for examination the following morning. This simple preparation gave very satisfactory results. Any form of rectal wash-out prior to

examination is to be avoided, because the resultant hyperæmia tends to obscure many of the finer lesions as seen through the sigmoidoscope.

The "Coldlite" sigmoidoscope was employed with an X5 eyepiece, and the patients were examined in the knee-elbow position. The sigmoidoscopic findings in these cases can be briefly tabulated :—

Normal	12
Acute general inflammation	10
Hyperæmia with hæmorrhages	8
Pin-point craters	8
Stricture	1
Ulcer	1

Thus in eighteen of the cases the changes in the rectal mucosa were consistent with an active or healing bacillary dysentery infection. One case showed a deep ulcer, from the base of which E. histolytica could not be identified, but from which dysentery organisms were isolated. One case showed the presence of a stricture, which was caused during the acute bacillary dysenteric infection when the rectal mucosa sloughed, and was passed as a cast.

Pin-point craters were found on the rectal mucosa of eight of the cases. These lesions are regarded as pathognomonic of chronic amœbic dysentery (Cropper, 1945). However, Fairley and Boyd (1943) regard widespread pitting at the site of former ulcers as characteristic of the healing stage of bacillary dysentery. Of these eight cases showing crateriform lesions, there was a "history" of amœbiasis in five, but no trophozoites or cysts of E. hystolitica at the time of examination.

The diagnostic significance of such lesions at sigmoidoscopy is, therefore, of problematical value in distinguishing between amœbic and bacillary dysentery.

RESULTS :—

STOOL CULTURE AND SIGMOIDOSCOPY SWAB

	Stool− Sig. +	Stool+ Sig. +	Stool+ Sig. −	Positive Stool	Positive Sigmoidoscopy
Flexner	4	12	18	30	16
Sonne	0	0	0	1	Not performed
Shiga	0	2	0	2	2
Schmitz	0	0	3	3	0

CULTURAL RESULTS

	EMB.+ D.C. −	EMB.+ D.C. +	EMB.− D.C. +	Positive EMB.	Positive D.C.	TOTAL
Flexner	1	9	24	10	33	34
Sonne	0	1	0	1	1	1
Shiga	0	2	0	2	2	2
Schmitz	0	1	2	1	3	3

EMB. = Eosin methylene blue.

D.C. = Sodium desoxycholate medium (Hyne's modification).

BACTERIOLOGICAL CLASSIFICATION

Flexner 34; Sonne 1; Shiga 2; Schmitz 3; Total 40

Typing of Flexners.

The B. dysenteriæ Flexner strains isolated were typed, using specific absorbed monovalent sera, by slide agglutination, confirmed by tube agglutination in the water bath. The final types were found to be :—

B. dysenteriæ Flexner	I	15
Do.	II	8
Do.	III	4
Do.	IV	2
Do.	V	2
Do.	VI	3
		34

Discussion.

The cases represent a fair sample of the type of patient with chronic bowel infection invalided from overseas commands back to this country.

All had a history of long-continued or relapsing diarrhœa. The majority would satisfy the clinical criteria for the diagnosis of chronic bacillary dysentery, i.e., long-continued diarrhœa with exacerbation and the occasional passage of blood and mucus.

The cases could be arbitrarily divided into two groups, on the basis of the pathological changes found in the lower bowel on sigmoidoscopic examination.

1. Chronic bacillary dysentery.
   These show some pathological changes in the rectal mucosa, suggestive of chronic bacillary infection.
2. Chronic bacillary dysentery carriers.
   These showing a normal rectal mucosa.

The validity of such a division is problematical, but it is interesting that bacillary dysentery organisms were isolated from cases with a long history of diarrhœa, who showed no pathological changes in the rectum. The absence of demonstrable intestinal lesions in chronic dysentery carriers is in accordance with the views of the chronic carrier state in general, but contrary to that of Boyd and Fairley (1944), who consider that deep ulcers are always present in cases of chronic bacillary dysentery carriers. The absence of demonstrable ulcers in the lower bowel does not, however, exclude the possibility of the presence of such ulcers in some other part of the large bowel beyond the normal sigmoidoscopic range.

Only one case showed the presence of a deep ulcer in the rectum, which was thought to be of amœbic origin. Repeated examination of the stools failed to reveal any pathogenic protozoa or bacteria. A scraping taken during sigmoidoscopy from the base of the rectal ulcer showed no E. histolytica, but on culture, B. dysenteriæ Flexner VI (P. 88) was isolated. The ulcer healed satisfactorily after a course of sulphaguanidine.

In the investigation of cases of chronic diarrhœa, sigmoidoscopy is invaluable, for not only can the lower bowel be visualised and the nature and severity of the

pathological lesion determined, but specimens can also be taken directly from the wall of the gut or the bases of mucosal ulcers. Such specimens are sometimes culturally positive when frequent stool examinations are negative (four out of forty). Sigmoidoscopy swabs form, therefore, a useful diagnostic aid in the isolation of dysentery organisms in chronic cases and carriers, and combined with examination of specimens of stools, render the bacteriological diagnosis more certain.

In the isolation of dysentery organisms the selectivity of the desoxycholate medium (Hyne's modification) is well known. It must, however, be combined with a less selective medium, as occasional strains are completely inhibited on the selective medium, and only grow out on the less selective one.

Flexner dysentery organisms were isolated from thirty-four out of the forty cases. This is, in all probability, a reflection of the general incidence of Flexner dysentery rather than any predisposition by this organism to produce chronic bacillary dysentery or a chronic carrier state.

The further subdivision of the Flexner group is confused owing to the existence of three methods of classification. The English school have followed the work of Andrewes and Inman (1920), with a classification into five basic types:—V, W, X, Y, and Z, with intermediate variants, VZ and WX.

Boyd has added three other types: 103, P.118, and P.88 (Newcastle-Manchester-P.88 variant), and has shown that all the Flexners, except X and Y, possess a type specific antigen as well as a complex group antigenic component. Flexners X and Y are artificial products of the laboratory, and possess no type specific components of their own. As a result of this work, Boyd (1938) has suggseted a modified classification of the Flexner group, which depends on the possession of type specific antigenic components.

Andrewes and Inman			Boyd	
V	...	...	I	
W	...	...	II	
X	...	...	...	(degraded III)
Y	...	...	...	(degraded II)
Z	...	...	III	
103	...	...	IV	
P.118	...	...	V	
P.88	...	...	VI	

This work has been substantiated and amplified by Wheeler (1944) in America, who has suggested that it should be more widely adopted.

The majority of strains can be satisfactorily typed using Oxford standards anti-sera, but occasional strains, mainly of Flexner types I, II, and III, give equivocal results owing to group cross reaction.

The use of anti-sera, with the group component removed by absorption, offers a ready means of typing according to the specific antigenic component, and has been utilized in this investigation.

Occasional strains, however, occur with a normal type specific antigen, but abnormal group antigenic components. Wheeler has described a strain isolated in

America with the specific antigen of Flexner II and the group component of X, and I have isolated another aberrant strain from cases of bacillary dysentery in West Africa. Such strains prove difficult to type owing to group cross reactions. They can be shown to possess a specific antigenic component by reactions with absorbed homologous type specific sera, but sera prepared from such strains are not completely absorbed by the Flexner type, whose type specific antigen they possess, i.e., they have the specific component of one Flexner type associated with an aberrant group antigenic structure.

Complete antigenic analysis of aberrant strains would require the demonstration of the type specific and also the group antigenic components. Such a complete analysis is rarely necessary, except from an epidemiological point of view, but indicates the mounting complexity of the problem of the antigenic structure of the Flexner group.

Summary.

1. During the bacteriological examination of seven hundred cases of chronic diarrhœa and relapsing amœbic dysentery, organisms of the dysentery group were isolated from forty.
2. The value of the desoxycholate medium is again shown, together with the necessity for using a less selective medium in parallel if maximum isolation is to be obtained.
3. Sigmoidoscopy is an important diagnostic aid. Sigmoidoscopy swabs, although inferior to fæcal specimens, were culturally positive in four cases where repeated stool cultures proved negative.
4. The majority of the dysentery organisms isolated belonged to the Flexner group (thirty-four out of forty).
5. Some Flexner strains cannot be satisfactorily typed using Oxford standards sera.
6. Specific absorbed sera give clear-cut results, which allow of classification according to the major antigenic component.
7. Some Flexner strains exist with the specific antigen component associated with an aberrant group antigenic structure.

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